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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/380,630	09/20/1999	HIROTOSHI HAYAKAWA	2651-0028-2X	2862

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EXAMINER

PADGETT, MARIANNE L

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 01/15/2003

18

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/360,630

Applicant(s)

Hayakawa et al

Examiner

M.L. Pugh

Group Art Unit

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— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☒ Responsive to communication(s) filed on 10/31/02
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-3, 10, 15 + 23 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-3, 10, 15 + 23 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____.
- ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

Office Action Summary

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1. The request filed on 10/31/02 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/380,630 is acceptable and a CPA has been established. An action on the CPA follows.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 10, 15 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa (JP 60-224,588A, abstract), optionally considering Tanaka et al; and further in view of Hongo et al.

The Japanese abstract to Furukawa teaches laser marking transparent substrates by irradiating through the substrate to sputter (vaporize) metal marking material opposed to it, where the metal and substrate have a gap between them that is $\leq 10\mu\text{m}$. Patterns are formed by this technique. Note the type of pattern is a design or decoration choice, and obviously depends on end use. No copy of the Japanese patent to Furukawa was available at this time, however one and its English translation have been ordered by the examiner. Further discussion of Furukawa's process may be found in Tanaka et al (col. 1, lines 48 - col. 2, line 3 and col. 6, line 61 - col. 7, line 2), where the information of the abstract is repeated, and it is disclosed that the patterns may be characters or code, but also that the evaporated metal is liable to be diffuse in Furukawa's process causing patterns to be blurred. Note Tanaka et al further elaborates on types of codes (col. 6, lines 12-17) including bar codes.

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Hongo et al teach correcting defects in metal patterns on transparent substrates, via removal of opaque defects by laser ablation. On col. 1, lines 10-29, conventional use of laser to remove opaque defects by direct irradiation of the undesired metal is discussed, where while not perfect it does remove the metal and has been done for the purpose. For their particular invention, Hongo et al teach removal of opaque defects by irradiating through the transparent substrate to ablate the metal starting at the substrate metal interface and exploding it away (abstract; col. 1, lines 56 - col. 2, line 6⁺; col. 3, line 43 - col. 4, line 46⁺; col. 8, line 23-57; and claims). It would have been obvious to one of ordinary skill in the art to use either the conventional process or Hongo et al's invention process to remove opaque defects created in the marking process of Furukawa, because Hongo et al is intended to be used on the generic type of transparent/metal composite created thereby, and suggest use for more than the specific photomask example (col. 8, lines 23-25), and furthermore, as evidenced by Tanaka et al, the Furukawa process may produced blurred patterns that may be considered opaque defects, hence are thus suggest for correcting and would have been expected to be effectively treated by either processes as discussed in Hongo et al.

Furukawa et al does not discuss the power per unit area needed for their process, and Hongo et al only discusses power requirements for their invention, not the conventional direct laser removal process. Also, it is noted that where these relative powers are being measured is not limited or claimed, and the power/unit area at the beam's focal point will be higher than away from it. One would expect the beam focus to be different in the claimed first and second processes, such as for example at the marking material, and the deposit, respectively, but it is not stated where or how the comparison of claim 2 is being made, so that the claim is read on if at

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any point in the beam the power/unit area of the first laser is greater than that of the second.

Hongo et al discusses how to optimize the peak power density of the beam spot, with the number of beam spots and the desired substrate surface morphology (col. 6, lines 34 - col. 7, line 14).

For like focal spots, one would have expected to require lesser power densities when not passing the laser beam through the substrate, due to the lack of attenuation caused by the substrate. In all cases, the initial deposition process of Furukawa or the two removal processes discussed by Hongo et al, one of ordinary skill in the art would use routine experimentation to determine what power densities will achieve the taught effects of the references for particular lasers and materials, and would have expected lower power for either removal process than the initial depositing because of greater attenuation the deposition must overcome.

The Furukawa abstract does not discuss the thickness of his depositions, however in Hongo et al (col. 3, lines 29-42, esp. line 34) an exemplary thin metal film thickness on transparent substrates is 700\AA or $0.07\mu\text{m}$, which is less than $10\mu\text{m}$, and or on the order of $0.1\mu\text{m}$. Due to analogous types of marking, it would have been obvious to one of ordinary skill in the art to employ thickness on the order of that exemplified in Hongo et al, as it effectively provides metal patterning on transparent substrates, consistent with Furukawa et al, with optimization for requirements of specific enduses.

4. Of interest to the present claims, Drew et al and Hase et al provide laser/substrate/markings material configurations commensurate with the "first process" of claim 1; while the Japanese patent to Kouichi appears to provide further teachings (Fig. 1 and 2) similar or related to Hongo et al's discussions. Yosheda et al is of interest for showing successive deposition followed by removal.

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5. Any inquiry concerning this communication should be directed to M L. Padgett at telephone number 703-308-2336 on M-F from about 8 am - 4:30 pm, FAX # (703) 872-9311 (regular); 872-9311 (after final); and 305-6078 (informal).

M. L. Padgett/mn 01/03/03
January 14, 2003

A handwritten signature in cursive script, appearing to read "Marianne L. Padgett", written in black ink.

MARIANNE PADGETT
PRIMARY EXAMINER